

STAFF SELECTION COMMISSION
COMBINED HIGHER SECONDARY LEVEL (TIER-I)
SOLVED PAPER

(8th August 2023: Shift-3)

Time Allotted- 1 hour

Max marks- 200

Important Instructions:-

- ⇒ This paper contains 100 questions which are divided into 4 sections and each section contains 25 questions.
 - ✓ English Language (Basic Knowledge)
 - ✓ General Intelligence
 - ✓ Quantitative Aptitude (Basic Arithmetic Skill)
 - ✓ General Awareness
- ⇒ There will be 2 marks for each correct answer and also there will be negative marking of 0.50 marks for each wrong answer.
- ⇒ Each question is compulsory to attempt and there will be no negative marking for unattempted questions.

English Language

1. Select the ANTONYM of the word dulcet to fill in the blank.
He has _____ words for his opponents.
1. sweet 2. penurious 3. enliven 4. harsh
2. Select the option that has NO spelling or grammatical errors.
 1. Although he had never traveled abroad before, Jack felt confident navigeting the unfamiliar castoms and language.
 2. Although he had never travelled abroad before, Jack felt confident navigating the unfamiliar customs and language.
 3. Although he had never traveled abroad before, Jack felt confidant navigating the unfamilliarr customs and language.
 4. Although he had never traveled abroad before, Jack felt confident navigeting the unfamilliarr castoms and language.
3. Select the most appropriate ANTONYM of the given word.
Pernicious
 1. Malicious 2. Wicked
 3. Injurious 4. Compassionate
4. Select the most appropriate meaning of the given idiom.
On the straight and narrow
 1. The unrefined and complicated
 2. The straightforward and ethically acceptable
 3. The honest but dubious
 4. The unpredictable though genuine
5. Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.
A. a match B. we need to establish
C. and student' needs D. teaching methods
E. between
 1. CBADE 2. BECDA 3. BACDE 4. BAEDC
6. Select the option that can be used as a one-word substitute for the given group of words.
The allowance which is paid to wife on legal separation
 1. Racisms 2. Dowry 3. Alimony 4. Money
7. Select the most appropriate idiom to fill in the blank.
Never believe anything you hear from others. Try to get every bit of information _____, if possible.
 1. in the fast lane
 2. straight from the horse's mouth
 3. down the line
 4. fair and square
8. Select the most appropriate ANTONYM of the given word from the following sentence.
Suspicious
Although the web server was problematic, Sudha was certain that she will submit her form on the portal by evening.
 1. certain 2. problematic
 3. submit 4. portal
9. Parts of a sentence are given below in jumbled order. Select the option that arranges the parts in the correct order to form a meaningful sentence.
A. fan on because of B. covered the noise
C. he slept with the D. the heat, and that
E. of the baby crying
 1. B, A, D, C, E 2. D, B, E, A, C
 3. C, A, D, B, E 4. B, D, E, A, C
10. Select the option that can be used as a one-word substitute for the given group of words.
A word or a phrase formed by rearranging a different word
 1. Anaphora 2. Amateur 3. Anagram 4. Accessible
11. Select the option that can be used as a one-word substitute for the given group of words.
A group of fish swimming together
 1. Herd 2. Shoal 3. Flock 4. Mob
12. Parts of the following sentence have been given as options. Select the option that contains an error.
Sita spotted golden deer and requested Rama to capture it.
 1. to capture it 2. Sita spotted golden
 3. deer and 4. requested Rama
13. Parts of the following sentence have been given as options. Select the option that contains an error.
The committee was divided on the issue, and neither side were willing to compromise on the compensation amount to be given.
 1. and neither side were willing to
 2. amount to be given
 3. compromise on the compensation
 4. The committee was divided on the issue
14. Select the option that correctly expresses the following sentence in active voice.
It has been done by them.
 1. They has done it 2. They have done it
 3. They did it 4. They had done it
15. Select the most appropriate ANTONYM of the word given in brackets to fill in the blank.
The sound of rain tapping against the window was a _____ (stimulating) melody, lulling him to sleep.
 1. Stressful 2. Troubling 3. Subduing 4. Harsh
16. Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.
A. one method of education
B. would only produce one kind of man

C. consists in the variety of which it is capable

D. but the great excellence of human nature

1. ACBD 2. ABDC 3. ACDB 4. ABCD

17. Select the most appropriate synonym of the underlined word.
The decision of the committee may mitigate the growth of the organisation.

1. Show 2. Accelerate 3. Divert 4. Lessen

18. Select the option that expresses the given sentence in passive voice.

Everybody knows Nelson Mandela.

1. Nelson Mandela is known to everybody.
2. Nelson Mandela can be known to everybody.
3. Nelson Mandela knows everybody.
4. Nelson Mandela was known to everybody.

19. Select the most appropriate homophones to fill in the blanks.
He was criticised for the _____ leadership of his team. His casual body language seemed _____ for a leader.

1. inapt; inapt 2. inapt; inept
3. inept; inapt 4. inept; inept

20. Identify the INCORRECTLY spelt word in the following sentence and select its correct spelling from the given options.
Factories have to follow a proper procedure to dispose of the hazerdous material.

1. disspose 2. procedure
3. hazardous 4. Factouries

Comprehension:

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

A pathogen is a 1 _____, virus, parasite or fungus that can cause disease within the body. Each pathogen is made up of several subparts, usually unique to that specific pathogen and the 2 _____ it causes. The subpart of a pathogen that causes the formation of antibodies is called an 3 _____. The antibodies produced in response to the pathogen's antigen are an important part of the 4 _____ system. You can consider antibodies as the 5 _____ in your body's defence system.

21. Select the most appropriate option to fill in blank number 1.
1. bacterium 2. medicine 3. potion 4. solution
22. Select the most appropriate option to fill in blank number 2.
1. remedy 2. cure 3. aftermath 4. disease
23. Select the most appropriate option to fill in blank number 3.
1. agent 2. infection 3. enzyme 4. antigen
24. Select the most appropriate option to fill in blank number 4.
1. health 2. immune 3. antigen 4. nervous
25. Select the most appropriate option to fill in blank number 5.
1. vulnerability 2. culprits 3. soldiers 4. loophole

General Intelligence

26. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some goats are eagles.

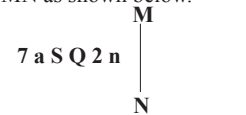
All eagles are snakes.

No duck is an eagle.

Conclusions:

- (I) No snake is a goat.
(II) Some ducks are snakes is a possibility.
(III) Some ducks are not goats
1. Only conclusion II follows
2. Both conclusions II and III follow
3. Only conclusion III follows
4. Both conclusions I and II follow

27. Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.



1. n 2 Q 2 s 7 2. n S Q 2 s 7
3. u S Q 2 s 7 4. n S Q 2 s 7

28. Select the correct combination of letters to sequentially replace the blanks and to make the given series logically complete.

X _ B _ B _ B B _ B _

1. BBXBBX 2. XXBBXB
3. BXBXXB 4. XBXXBX

29. What should come in place of the question mark (?) in the given series?

339, 340, 348, ?, 439

1. 377 2. 492 3. 380 4. 375

30. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All flowers are trees.

All branches are leaves.

No flowers are leaves.

Conclusions:

(I) No branches are flowers.

(II) No trees are leaves.

1. Both conclusions (I) and (II) follow
2. Only conclusion (II) follows
3. Neither conclusion (I) nor (II) follows
4. Only conclusion (I) follows

31. Which term from among the given options can replace the question mark (?) in the following series to make it logically complete?

D 13 Q, F 17 R ?, J25 T L 29 U

1. G 22 R 2. G 21 S 3. H 22 R 4. H 21 S

32. If the 5th of the month falls on the third day after Sunday, what will be the day on the 15th of that month?

1. Friday 2. Sunday 3. Saturday 4. Monday

33. AHL is related to ELP in a certain way based on the English alphabetical order. In the same way, GMP is related to KQT. To which of the following is FQS related following the same logic?

1. JUW 2. SFQ 3. SQF 4. ITV

34. In a certain code language, 'ACTION' is coded as '527491' and 'OCTANE' is coded as '759213'. What is the code for 'E' in the given code language?

1. 9 2. 7 3. 5 4. 3

35. Which letter-cluster should come in place of? in the given series based on the english alphabetical order?

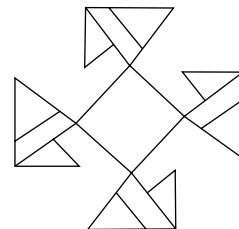
XEM, ZGO, BIQ, DKS, ?

1. FMU 2. DNV 3. FOV 4. ENU

36. If it was Tuesday on 21st February 2017, then what will be the day of the week on 5th February 2025? (2020 and 2024 are leap years.)

1. Thursday 2. Tuesday
3. Monday 4. Wednesday

37. How many triangles are there in the given figure?



1. 14 2. 12 3. 13 4. 11

38. In a certain code language, 'ask the doctor' is written as 'nq sp ml' and 'you can ask' is written as 'jl ml tr'. How is 'ask' written in the given language?

1. ml 2. sp 3. tr 4. ng

39. What should come in place of the question mark (?) in the given series?

3, 10, 39, ?, 885, 5346, 37471

1. 56 2. 45 3. 720 4. 172

40. Select the triad from the below options that has the same analogy as the following triads.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 – Operations on 13 such as adding/subtracting/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

6 : 36 : 216

17 : 289 : 4913

1. 22 : 440 : 9000

2. 21 : 400 : 9200

3. 21 : 441 : 9261

4. 22 : 400 : 9999

41. P is the father of E, E is the sister of A. A has only one brother L. T is the only grandson of P. M is the wife of A. Only one child of P is married. How is L related to T?

1. Father 2. Son
3. Father's brother 4. Mother's brother

42. What will come in the place of '?' in the following equation, if '+' and '-' are interchanged and '×' and '÷' are interchanged?

$16 \div 4 + 15 \times 5 - 47 = ?$

1. 118 2. 128 3. 138 4. 108

43. Identify the figure given in the options which when put in place of ? will logically complete the series.



1. 2. 3. 4.

44. Select the correct mirror image of the given figure when the mirror is placed at MN as shown.



1. 2. 3. 4.

45. Based on the alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does NOT belong to that group?

1. SQT 2. BEH 3. WUX 4. FDG

46. What will come in the place of '?' in the following equation, if '+' and '-' are interchanged and '×' and '÷' are interchanged?

$273 \div 3 - 84 + 65 \times 5 = ?$

1. 152 2. 154 3. 122 4. 124

47. Select the correct combination of letters to sequentially replace the blanks and to make the given series logically complete.

M _ J _ M _ _ M _ _

1. MJMJMJM

2. MMJMJMJ

3. JMJMJMJ

4. JJMJMMJ

48. Select the number from among the given options that can replace the question mark (?) in the following series.

222, 254, 227, 249, 232, 244, ?

1. 237 2. 239 3. 235 4. 242

49. What will come in the place of the question mark (?) in the following equation if '+' and '-' are interchanged and '×' and '÷' are interchanged?

$214 - 65 \times 5 \div 7 + 21 = ?$

1. 255 2. 269 3. 279 4. 284

50. Three of the following four are alike in a certain way and thus form a group. Which is the one that does NOT belong to that group?

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 – Operations on 13 such as adding/subtracting/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

1. 72-89 2. 19-36 3. 24-41 4. 57-67

Quantitative Aptitude

51. An article is marked at ₹450. If it is sold at a discount of 20%, then the selling price becomes 1.5 times of its cost price. What is the cost price (in ₹)?

1. 360 2. 240 3. 330 4. 270

52. How many solid spheres are made if a metallic cone of radius 12 cm and height 24 cm is melted into sphere of radius 2 cm each?

1. 105 2. 101 3. 108 4. 103

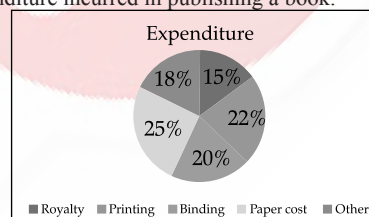
53. 'If $\sin \phi = 5/6$, the value of $\cot \phi \cdot \sin \phi \cdot \cos \phi$ is _____.

1. $\frac{6}{5}$ 2. $\frac{25}{36}$ 3. $\frac{5}{6}$ 4. $\frac{11}{36}$

54. A shopkeeper sells a table at a discount of 25% on the marked price and earns a profit of 80%. If he sells the same table at a 40% discount, then his new profit is:

1. 31% 2. 44% 3. 33% 4. 41%

55. The following pie chart shows the percentage distribution of the expenditure incurred in publishing a book.



Find the paper cost, if the royalty is ₹ 22,500.

1. ₹32,500 2. ₹37,500 3. ₹30,000 4. ₹33,000

56. From a cask filled with wine, 75 litres are first drawn and replaced with water. From this mixture, 60 litres are drawn and replaced with water. The ratio of wine to water in the cask is now 3 : 2. How many litres of wine did the cask initially hold?

1. 225 2. 250 3. 375 4. 300

57. Find the value of $\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} + 2$.

1. $1 + 2 \sec A$ 2. $2 - \sec A$
3. $2 + \sec A$ 4. $2(1 + \sec A)$

58. Two numbers, when divided by a certain divisor, leave the remainder 57. When sum of the two numbers is divided by the same divisor, the remainder is 49. The divisor is:

1. 56 2. 57 3. 49 4. 65

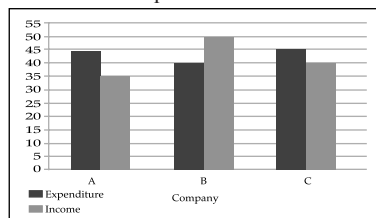
59. Mahima purchased a Saree for ₹ 792 after successive discounts of 20% and 12%. The marked price of the Saree was:

1. ₹ 968 2. ₹ 1,025 3. ₹ 875 4. ₹ 1,125

60. If the curved surface area of a cylinder is increased by 20%, and height is decreased by 4%, then the net decrease or increase in the volume will be:

1. 36% decrease 2. 20% increase
3. 50% increase 4. 33% decrease

61. The following bar graph shows the incomes and expenditures (in million rupees) of three companies in the year 2020. Study the graph and answer the question that follows.



Which company earned the maximum percentage profit (Profit is calculated on expenditure) in the year 2020, and by what percentage?

1. Company A, by 18% 2. Company B, by 20%
 3. Company B, by 25% 4. Company C, by 15%
62. In a linear race of 1000 m. Prakash beats Ved by 280 m, while Ved beats Rahul by 100 m. By how many metres does Prakash beat Rahul, in the same race?
1. 346 2. 350 3. 352 4. 348
63. ΔLON and ΔLMN are two right-angled triangles with common hypotenuse LN such that $\angle LON = 90^\circ$ and $\angle LMN = 90^\circ$. LN is the bisector of $\angle OLM$. If LN = 29 cm and ON = 20 cm, then what is the perimeter (in cm) of ΔLMN ?
1. 67 2. 62 3. 65 4. 70
64. If $x^4 + \frac{1}{x^4} = 194, x > 0$, then find the value of $x^3 + \frac{1}{x^3} + x + \frac{1}{x}$.
1. 76 2. 66 3. 56 4. 46
65. By selling a watch for ₹1,600, a person gets profit that is equal to the loss of selling the same watch for ₹1,400. If the person wants to get a profit of 20%, at what price should he sell the watch?
1. ₹1,800 2. ₹1,700 3. ₹1,850 4. ₹1,750
66. On a sum of money for 2 years compound interest and simple interest are ₹550 and ₹500. Find the rate of interest (in per annum).
1. 40% 2. 10% 3. 20% 4. 30%
67. Two circles with diameters 50 cm and 58 cm, respectively, intersect each other at points A and B, such that the length of the common chord is 40 cm. Find the distance (in cm) between the centres of these two circles.
1. 34 2. 37 3. 36 4. 35
68. The average number of runs scored by a cricketer in 42 innings is 30. The difference between his maximum and minimum scores in an inning is 100. If these two innings are not taken into consideration, then the average score of the remaining 40 innings is 28. What are the maximum runs scored by him in an inning?
1. 120 2. 105 3. 115 4. 110
69. In an army camp, there is food provision for 500 cadets for 25 days. If 125 more persons join the army camp on the first day itself, then for how many days will the provision last?
1. 20 2. 15 3. 10 4. 25
70. In ΔABC , $\angle A = 5x - 60^\circ$, $\angle B = 2x + 40^\circ$, $\angle C = 3x - 80^\circ$. Find $m\angle A$.
1. 75° 2. 90° 3. 80° 4. 60°
71. If θ is an acute angle and $\sin \theta = \frac{13}{19}$, what is the value of $\cos \theta$?
1. $\frac{6}{19}$ 2. $\frac{10\sqrt{2}}{19}$ 3. $\frac{14}{19}$ 4. $\frac{8\sqrt{3}}{19}$
72. The length of the common tangent PQ for two circles touching externally is 16 cm. If the radius (OP) of the bigger circle is 20 cm, then the radius (RQ) of the smaller circle is:
1. 3.2 cm 2. 3.6 cm 3. 3.5 cm 4. 3.8 cm

73. If $a + b + c = 5$, $a^2 + b^2 + c^2 = 15$, then find the value of $a^3 + b^3 + c^3 - 3abc - 27$.

1. 23 2. 27 3. 25 4. 21

74. The following table shows the month-wise temperature of four cities from January to May 2022 (in degree Celsius).

Months	Hyderabad	Bangalore	Pune	Kolkata
January	26°	22°	24°	25°
February	27°	24°	25°	26°
March	34°	30°	32°	32°
April	37°	32°	35°	34°
May	42°	36°	40°	40°

Which city recorded the maximum temperature in all five months compared with the other cities?

1. Pune 2. Bangalore
3. Hyderabad 4. Kolkata

75. If $x^2 + y^2 = 427$ and $xy = 202$, then find the value of $\frac{x+y}{x-y}$.

1. $\sqrt{\frac{835}{23}}$ 2. $\sqrt{\frac{830}{29}}$ 3. $\sqrt{\frac{831}{23}}$ 4. $\sqrt{\frac{830}{23}}$

General Awareness

76. Which of the following cell divisions is known as reduction division?
1. Telophase 2. Meiosis 3. Prophase 4. Mitosis
77. Tharman Shanmugaratnam has been recently appointed as the President-elect of which of the following countries?
1. Indonesia 2. Singapore
 3. Malaysia 4. Nigeria
78. Which glacier is the source of river Gori Ganga which is an important tributary of river Kali?
1. Tipra Glacier 2. Milam Glacier
 3. Namik Glacier 4. Kafni Glacier
79. Which of the following is mentioned in Article 39A of the Indian Constitution?
1. To secure adequate means of livelihood
 2. To promote equal justice and to provide free legal aid
 3. Equal pay for equal work
 4. Prevention of concentration of wealth
80. Pongal is a festival of which state?
1. West Bengal 2. Tamil Nadu
 3. Bihar 4. Odisha
81. The Chandrayaan-3 mission of India has confirmed the presence of which mineral on the moon's surface?
1. Mercury 2. Sulphur 3. Nitrogen 4. Boron
82. Under which of the following Articles of the Indian constitution "Equality of opportunities include its reasonable classification and provisions for backward class of citizens" is provided.
1. Article 16 2. Article 18 3. Article 17 4. Article 19
83. Who is credited with setting up of Brahmo Sabha, for religious reforms, in 1828, which was later called Brahma Samaj?
1. Rabindranath Tagore 2. Raja Ram Mohan Roy
 3. Keshub Chandra Sen 4. Devendra Nath Tagore
84. Which physicist is known for discovering that any periodic wave can be represented as an infinite number of weighted sinusoids, i.e., the sum of sine and cosine waves?
1. Louis de Broglie
 2. Jean Baptiste Joseph Fourier
 3. Joseph-Louis Lagrange
 4. Ernest Walton

85. Which of the following laws represented by the formula T^2/R^3 , compares the orbital period and radius of the orbit of a planet with that of other planets?
 1. Hubble's Law 2. Copernicus's Law
 3. Kepler's Third Law 4. Bragg's Law
86. Mulayam Singh Yadav was awarded Padma Vibhushan in 2023 posthumously. He was the former Chief Minister of which of the following states?
 1. Punjab 2. Bihar
 3. Uttar Pradesh 4. Madhya Pradesh
87. The cropping season between Rabi and Kharif is called
 1. Aman 2. Boro 3. Zaid 4. Aus
88. Who among the following personalities is/was NOT an Indian Ghazal singer?
 1. Begum Akhtar 2. Chitra Singh
 3. Bhimsen Joshi 4. Jagjit Singh
89. In August 2023, which country's lunar mission named LUNA-25 ended in failure with the spacecraft crashing onto the lunar surface?
 1. USA 2. Russia 3. Japan 4. China
90. In which of the following years was Muslim League founded?
 1. 1907 2. 1905 3. 1909 4. 1906
91. What was the theme of the G-20 summit 2023?
 1. The Globalised world
 2. One Earth, One Family, One Future
 3. Transcending the geographical boundaries of the world
 4. Post COVID world
92. While using the income method to compute national income, which of the following is NOT to be included?
 A. Income from lottery
 B. Brokerage on sale and purchase of shares
 C. Income from illegal activities like gambling
 1. A, B and C 2. B and C 3. A and B 4. A and C
93. Under the new IPL rule in 2023, who among the following Chennai Super King players became the first Impact player in the history of the tournament?
 1. MS Dhoni 2. Deepak Chahar
 3. Akash Singh 4. Tushar Deshpande
94. Which city is going to host the 2026 winter Olympics?
 1. Boston 2. Beijing
 3. Milan-Cortina d'Ampezzo 4. Pyeongchang
95. The Fiscal policy achieves the macroeconomic goals by using which of the following instruments?
 1. Taxes 2. SLR 3. CRR 4. Bank rate
96. Which of the following folk dance forms is performed by men in Haryana?
 1. Khoria 2. Gidda 3. Ghoomar 4. Gugga
97. Which of these is NOT part of the classification of economic activities carried out in an economy?
 1. Production 2. Consumption
 3. Distribution 4. Law and order
98. Which of these statements is correct?
 1. The economic wealth of a country does not necessarily depend on the possession of resources.
 2. Countries endowed with natural resources are naturally the richest countries.
 3. The national income of a country is the total of all its resources.
 4. Whether resources are used in generating a flow of output and as a result, income and wealth, is immaterial.
99. The Gahadavalas ruled over which region of India?
 1. Ajmer 2. Malwa 3. Kannauj 4. Patan
100. Which of these is one of the fall out of the industrial licensing system?
 1. Large industrial houses availed licenses to prevent competition
 2. Most licenses were used up by backward states
 3. Most licenses were for importing goods
 4. Many small private firms appropriated licenses

Answer Key

1. (4)	2. (2)	3. (4)	4. (2)	5. (4)	6. (3)	7. (2)	8. (1)	9. (3)	10. (3)
11. (2)	12. (2)	13. (1)	14. (2)	15. (3)	16. (2)	17. (4)	18. (1)	19. (3)	20. (3)
21. (1)	22. (4)	23. (4)	24. (2)	25. (3)	26. (1)	27. (2)	28. (3)	29. (4)	30. (1)
31. (4)	32. (3)	33. (1)	34. (4)	35. (1)	36. (4)	37. (2)	38. (1)	39. (4)	40. (3)
41. (3)	42. (4)	43. (1)	44. (3)	45. (2)	46. (1)	47. (2)	48. (1)	49. (4)	50. (4)
51. (2)	52. (3)	53. (4)	54. (2)	55. (2)	56. (4)	57. (4)	58. (4)	59. (4)	60. (3)
61. (3)	62. (3)	63. (4)	64. (3)	65. (1)	66. (3)	67. (3)	68. (1)	69. (1)	70. (3)
71. (4)	72. (1)	73. (1)	74. (3)	75. (3)	76. (2)	77. (2)	78. (2)	79. (2)	80. (2)
81. (2)	82. (1)	83. (2)	84. (2)	85. (3)	86. (3)	87. (3)	88. (3)	89. (2)	90. (4)
91. (2)	92. (4)	93. (4)	94. (3)	95. (1)	96. (4)	97. (4)	98. (1)	99. (3)	100. (1)

Answers with Explanations

1. Option (4) is correct.

He has harsh words for his opponents. Since the words are directed at opponents (enemies), so the words will be harsh/rude.

2. Option (2) is correct.

Option (1) has incorrect spellings of 'traveled/navigating/castoms'; option (3) has incorrect spellings of 'traveled/unfamilliar'; option (4) has incorrect spellings of 'navigeting/unfamilliar/castoms'. Thus, option (2) has the correct usage of spellings: Although he had never travelled abroad before, Jack felt confident navigating the unfamiliar customs and language.

3. Option (4) is correct.

'Pernicious' means 'having a harmful effect'. All of (1),

(2) and (3) are synonyms; while option (4) is the antonym 'compassionate'/sympathetic.

4. Option (2) is correct.

The idiom 'On the straight and narrow' means 'behave in a way that is honest and moral'. straightforward and ethically acceptable.

5. Option (4) is correct.

The correct sequence of the parts of sentence is : BAEDC. The subject starts in (B)- 'we' followed by a verb 'need to establish', which is followed by the object in A- a match. The match will be between 'teaching methods and student' needs'. So the logical sentence is: We need to establish a match between teaching methods and student' needs.

6. Option (3) is correct.

The allowance which is paid to wife on legal separation is known as 'alimony'. 'Dowry' is an amount of property or money brought by a bride to her husband on their marriage.

7. Option (2) is correct.

Never believe anything you hear from others. Try to get every bit of information straight from the horse's mouth, if possible. The phrase 'to hear something straight from the horse's mouth' means to hear the information from someone who has personal knowledge on the spoken matter. The idiom 'in the fast lane' implies in a way that is exciting and slightly dangerous; 'down the line' means 'that it happens in every case'; 'fair and square' means 'in an honest way and without any doubt'.

8. Option (1) is correct.

'Suspicious' means 'feeling doubt or no trust in someone or something'. So, the antonym is 'certain' (sure).

9. Option (3) is correct.

The correct sequence of the parts of sentence is : C, A, D, B, E. C starts with the subject 'he', and a verb 'slept'. This will be followed by an object in A 'fan'. The conjunction 'because' joins the cause 'the heat' and effect 'fan on'. Therefore, CAD form an inevitable link. The noise in B refers to the crying of the baby (E). So the logical sentence is: He slept with the fan on because of the heat, and that covered the noise of the baby crying.

10. Option (3) is correct.

Anaphora is the repetition of words or phrases in a group of sentences, clauses, or poetic lines. Amateur is a person who engages in a pursuit, especially a sport, on an unpaid rather than a professional basis. Anagram is a word or a phrase formed by rearranging a different word. Accessible connotes a place able to be reached or entered.

11. Option (2) is correct.

The collective noun 'a herd of' is used for elephants; 'Flock' applies to groups of animals, especially of sheep or goats, a *mob* is a large, disorganised, and often violent crowd of people; 'a shoal of' refers to a large number of fish swimming as a group.

12. Option (2) is correct.

Sita spotted a golden deer and requested Rama to capture it. 'Golden deer' will be preceded by the indefinite article 'a', meaning 'one', because the pronoun 'it' confirms its number.

13. Option (1) is correct.

The committee was divided on the issue, and neither side was willing to compromise on the compensation amount to be given. The use of indefinite pronoun 'neither' corroborates the need of singular verb 'was', instead of 'were'.

14. Option (2) is correct.

The sentence 'It has been done by them' is in passive voice. In voice change, the object of the active verb becomes the subject of the passive verb. Active sentences in the present perfect tense have the following structure: **Subject + has/have + past participle form of the verb + object**. Thus, the correct sentence is: They have done it.

15. Option (3) is correct.

The sound of rain tapping against the window was a subduing melody, lulling him to sleep. 'Stimulating' means 'encouraging or arousing interest or enthusiasm'. While 'subduing' means 'to reduce the force of something'.

16. Option (2) is correct.

The correct sequence of the parts of sentence is : ABDC. A starts with 'one method of education', which is elaborated in B- 'would only produce one kind of man', the conjunction 'but' contradicts

the idea established in AB. So, D comes next followed by C. So the logical sentence is: One method of education would only produce one kind of man but the great excellence of human nature consists in the variety of which it is capable.

17. Option (4) is correct.

'Mitigate' means to reduce/lessen. In the context, the decision of the committee may lessen the growth of the organisation.

18. Option (1) is correct.

The sentence 'Everybody knows Nelson Mandela' is in active voice. In voice change, the object of the active verb becomes the subject of the passive verb. Sentences in the simple present tense have the following structure: *Active*: Subject + V1 + object... *Passive*: Object + Is/are/am/+ verb (III form) + subject. Thus, the correct sentence is: Nelson Mandela is known to everybody. 'Known' takes 'to' after it when it is followed by an object.

19. Option (3) is correct.

He was criticised for the inept leadership of his team. His casual body language seemed inapt for a leader. Inapt means "inappropriate" and inept means "incompetent". Here, the person is criticised for the incompetent leadership of his team. Moreover, his body language was not appropriate for a leader.

20. Option (3) is correct.

In the sentence, 'Factories have to follow a proper procedure to dispose of the hazardous material'; 'hazardous' is spelt incorrectly, it is 'hazardous'. Hazardous implies dangerous.

21. Option (1) is correct.

A pathogen is a bacterium, virus, parasite or fungus that can cause disease within the body. The word 'pathogen' has the clue, as it includes all kinds of disease causing microorganisms, like virus, parasite or fungus, and 'bacterium'.

22. Option (4) is correct.

Each pathogen is made up of several subparts, usually unique to that specific pathogen and the disease it causes. It is already stated that pathogen can cause disease within the body.

23. Option (4) is correct.

The subpart of a pathogen that causes the formation of antibodies is called antigen. The subpart of a pathogen cannot be agent/infection/enzyme.

24. Option (2) is correct.

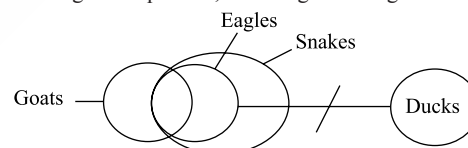
The antibodies produced in response to the pathogen's antigen are an important part of the immune system. The immune system is the body's tool for preventing or limiting infection.

25. Option (3) is correct.

You can consider antibodies as the soldiers in your body's defence system. The blank requires such a word/noun that qualifies antibodies protecting the body's defence system. For this 'soldier' is the perfect choice.

26. Option (1) is correct.

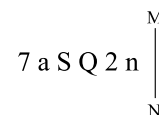
According to the question, following venn diagram can be made.



Hence, only conclusion II follows.

27. Option (2) is correct.

Given image:



In the mirror image, left becomes right, and right becomes left. Hence, the required image is:

$\pi \text{ } \Sigma \text{ } Q \text{ } 2 \text{ } 8 \text{ } \gamma$

28. Option (3) is correct.

Given that: X _ B _ B _ B B _ B _

Upon inserting the letters from option (3) sequentially, we get
X B B X B B X B B X B B

Hence, it forms a logical series.

29. Option (4) is correct.

Given that: 339, 340, 348, ?, 439

The pattern followed here is:

$$339 + 1^3 = 340$$

$$340 + 2^3 = 348$$

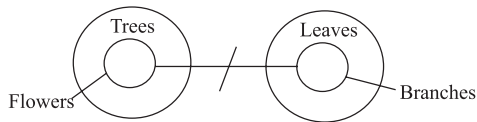
$$348 + 3^3 = 375$$

$$375 + 4^3 = 439$$

Hence, the missing number is 375.

30. Option (1) is correct.

According to the question, following venn diagram can be made.



Hence, Both conclusions (I) and (II) follow.

31. Option (4) is correct.

Given that: D 13 Q, F 17 R, ?, J 25 T, L 29 U

As per the pattern followed,

D	13	Q
+2	+4	+1
F	17	R
+2	+4	+1
H	21	S
+2	+4	+1
J	25	T
+2	+4	+1
L	29	U

Hence, 'H 21 S' is the missing set.

32. Option (3) is correct.

Since, 5th of the month falls on the third day after Sunday, then it will be Wednesday on 5th.

And, 5 + 7 days (a week) = 12th will also be a Wednesday.

Now, counting 3 days ahead of Wednesday, we arrive at Saturday.

33. Option (1) is correct.

The pattern followed here is:

A	H	L
+4	+4	+4
E	L	P

And,

G	M	P
+4	+4	+4
K	Q	T

Similarly,

F	Q	S
+4	+4	+4
J	U	W

So, JUW is correct set.

34. Option (4) is correct.

Given that:

ACTION \Rightarrow 527491

OCTANE \Rightarrow 759213

If we compare both of the words we get,

The codes for the alphabets A, C, T, I, O, N are 5, 2, 7, 4, 9, 1 (In random order), indicating that the only different letter remaining is 'E.'

Therefore, there is only one digit left for 'E' which is 3.

35. Option (1) is correct.

Given that: XEM, ZGO, BIQ, DKS, ?

As per the pattern followed:

X	E	M
+2	+2	+2
Z	G	O
+2	+2	+2
B	I	Q
+2	+2	+2
D	K	S
+2	+2	+2
F	M	U

So, the missing term is FMU.

36. Option (4) is correct.

Given that: It was Tuesday on 21st February 2017.

Let's count the number of odd days for each year which needs to be added in Tuesday.

2017 = +1

2018 = +1

2019 = +1

2020 = +2 (Leap year)

2021 = +1

2022 = +1

2023 = +1

2024 = +2 (Leap year)

Total no. of odd days = 10

So, 10 days ahead of Tuesday will be a Friday (On 21st February 2025)

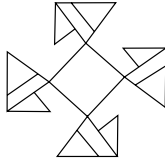
And, 21st February 2025 - 05th February 2025 = 16 days i.e. 2 weeks + 2 odd days.

Hence, counting 2 days before Friday we arrive at Wednesday.

Note: A non-leap year consists of 365 days, which is when divided by 7 (a week) results in 52 weeks and a remainder of 1, known as an odd day.

A leap year consists of 366 days, which is when divided by 7 (a week) results in 52 weeks and a remainder of 2, known as odd days.

37. Option (2) is correct.



As we can see, there are total 12 triangles formed (3 triangles in each portion).

38. Option (1) is correct.

Given that:

ask the doctor \rightarrow nq sp ml

you can ask \rightarrow ml tr

Hence, 'ask' can be coded as 'ml'.

39. Option (3) is correct.

Given that: 3, 10, 39, ?, 885, 5346, 37471

The pattern followed here is:

$$3 \times 2 + 2^2 = 10$$

$$10 \times 3 + 3^2 = 39$$

$$39 \times 4 + 4^2 = 172$$

$$172 \times 5 + 5^2 = 885$$

$$885 \times 6 + 6^2 = 5346$$

$$5346 \times 7 + 7^2 = 37471$$

Hence, the missing number is 172.

40. Option (3) is correct.

Given that:

6 : 36 : 216

17 : 289 : 4913

The pattern followed here is:

1st term : (1st term)² : (1st term)³

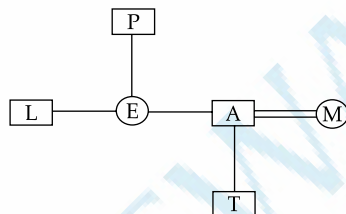
Checking option (3), 21 : 441 : 9261

Follows the same pattern as 21 : (21)² : (21)³

Hence, it is the correct option.

41. Option (3) is correct.

After decoding the statement, possible family tree which can be made is as follows:



Hence, L is father's brother of T.

42. Option (4) is correct.

Given that: $16 \div 4 + 15 \times 5 - 47 = ?$

After interchanging the signs, we get

$$16 \times 4 - 15 \div 5 + 47$$

According to the BODMAS rule,

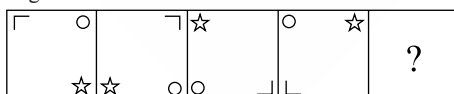
$$= 16 \times 4 - 3 + 47$$

$$= 64 - 3 + 47 = 61 + 47$$

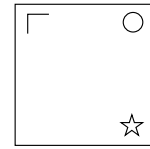
$$\Rightarrow 108$$

43. Option (1) is correct.

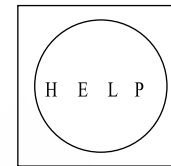
Given figure:



According to the pattern followed and the symmetry, the required figure is:



44. Option (3) is correct.



M N

When the mirror is placed beneath the figure, the orientation of the top and bottom is reversed. Hence, the required image is:



45. Option (2) is correct.

According to the pattern followed, we get

$$(1) \quad S \xrightarrow{-2} Q \xrightarrow{+3} T$$

$$(2) \quad B \xrightarrow{+3} E \xrightarrow{+3} H$$

$$(3) \quad W \xrightarrow{-2} U \xrightarrow{+3} X$$

$$(4) \quad F \xrightarrow{-2} D \xrightarrow{+3} G$$

Hence, BEH is the odd one out.

46. Option (1) is correct.

Given that: $27 \div 3 - 84 + 65 \times 5 = ?$

After interchanging the signs, we get

$$27 \times 3 + 84 - 65 \div 5$$

According to the BODMAS rule,

$$= 27 \times 3 + 84 - 13$$

$$= 81 + 84 - 13 = 165 - 13$$

$$\Rightarrow 152$$

47. Option (2) is correct.

Given that: M _ J _ M _ M _ M

Upon inserting the letters from option (2) sequentially, we get

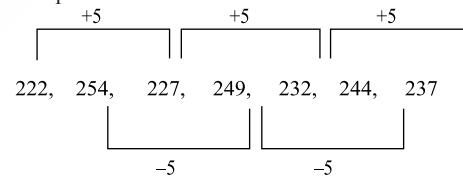
M M J M M J M M J M M J

Hence, it forms a logical series.

48. Option (1) is correct.

Given that: 222, 254, 227, 249, 232, 244, ?

The pattern followed here is:



Hence, 237 is the missing number.

49. Option (4) is correct.

Given that: $214 - 65 \times 5 \div 7 + 21 = ?$

After interchanging the signs, we get

$$214 + 65 \div 5 \times 7 - 21$$

According to the BODMAS rule,

$$\Rightarrow 214 + 13 \times 7 - 21$$

$$\Rightarrow 214 + 91 - 21$$

$$\Rightarrow 305 - 21 = 284$$

50. Option (4) is correct.

The pattern followed here is:

$$1^{\text{st}} \text{ term} + 17 = 2^{\text{nd}} \text{ term}$$

On checking option (4), $57 - 67$

$$57 + 17 = 74 \neq 2^{\text{nd}} \text{ term.}$$

Hence, it is the odd one out.

51. Option (2) is correct.

Market price of item = ₹450

Discount percentage = 20%

$$\therefore \text{Selling price, S.P} = 450 \times \left[\frac{100 - 20}{100} \right] = ₹360$$

$$\text{Now cost price, C.P} = \frac{360}{1.5} = ₹240$$

52. Option (3) is correct.

Radius and height at cone are 12cm and 24cm respectively.

Let number of small sphere made = n

According to question,

$$n \times \frac{4}{3} \times \pi \times 2^3 = \frac{1}{3} \times \pi \times 12^2 \times 24$$

$$\Rightarrow n = \frac{12 \times 12 \times 24}{4 \times 8} = 108$$

53. Option (4) is correct.

$$\begin{aligned} \cot \phi \cdot \sin \phi \cdot \cos \phi &= \frac{\cos \phi}{\sin \phi} \cdot \sin \phi \cdot \cos \phi = \cos^2 \phi \\ &= 1 - \sin^2 \phi \quad \left[\because \cot \theta = \frac{\cos \theta}{\sin \theta} \right] \\ &= 1 - \left(\frac{5}{6} \right)^2 \quad \left[\cos^2 \theta = 1 - \sin^2 \theta \right] \\ &= 1 - \frac{25}{36} = \frac{11}{36} \end{aligned}$$

54. Option (2) is correct.

Let market price of table = ₹ x

\therefore Selling price of table after 25% discount

$$= \frac{75}{100} x = ₹ \frac{3x}{4}$$

$$\Rightarrow \text{Cost price of table} = \frac{100}{(100 + 80)} \times \frac{3x}{4}$$

[\because profit% = 80%]

$$= \frac{5}{9} \times \frac{3x}{4} = \frac{5x}{12}$$

Selling price of table after 40% discount

$$= \frac{60}{100} x = \frac{3}{5} x$$

\therefore New profit percentage

$$\begin{aligned} &= \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100\% \\ &= \frac{\frac{3}{5}x - \frac{5x}{12}}{\frac{5x}{12}} \times 100\% \end{aligned}$$

$$= \frac{1100}{25} \% = 44\%$$

55. Option (2) is correct.

Let total expenditure = ₹ x

$$\therefore \text{Expenditure on royalty} = \frac{15}{100} x = 22500$$

$$\Rightarrow x = \frac{2250000}{15}$$

$$\Rightarrow x = ₹150000$$

$$\text{Expenditure on paper} = \frac{25}{100} \times 150000 = ₹37500$$

56. Option (4) is correct.

Let capacity of the given cask full of wine = x litres

Ratio of wine to water after first replacement of 75 litres.

So, now ratio of wine and water in cask.

$$= \frac{x - 75}{75} = (x - 75) : 75$$

Water removed from this mixture of,

$$= \frac{75}{x} \times 60$$

After mixing 60 l water, Now water in the mixture

$$= 75 - \frac{75 \times 60}{x} + 60$$

$$= \left(135 - \frac{4500}{x} \right) l$$

According to question,

$$\frac{x - \left(135 - \frac{4500}{x} \right)}{135 - \frac{4500}{x}} = \frac{3}{2}$$

$$\Rightarrow x = 300 \text{ or } \frac{75}{2}$$

\therefore First replacement of 75l. So, capacity of cask cannot be $\frac{75}{2}$ litres

\therefore Capacity of cask full of wine = 300 litres

57. Option (4) is correct.

$$\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} + 2$$

$$= \frac{\cos^2 A + (1 + \sin A)^2}{\cos A (1 + \sin A)} + 2$$

$$= \frac{\cos^2 A + 1 + \sin^2 A + 2 \sin A}{\cos A (1 + \sin A)} + 2 \quad [\cos^2 A + \sin^2 A = 1]$$

$$= \frac{1 + 1 + 2 \sin A}{\cos A (1 + \sin A)} + 2$$

$$= 2 \left[\frac{1 + \sin A}{\cos A (1 + \sin A)} \right] + 2$$

$$= \frac{2}{\cos A} + 2 = 2 \sec A + 2 = 2 [1 + \sec A]$$

58. Option (4) is correct.

Let the two numbers are x & y and divisor = m

$$\therefore x = Q_1 \times m + 57$$

$$y = Q_2 \times m + 57$$

[Where Q_1 and Q_2 are quotients in both cases]

$$\Rightarrow x + y = (Q_1 + Q_2)m + 114$$

$$= (Q_1 + Q_2)m + 65 + 49$$

$\therefore 49$ is remainder when sum of numbers divided by same divisor.

$$\Rightarrow \text{Divisor} = m = 65$$

59. Option (4) is correct.

Let market price of saree = ₹ x

\therefore Selling price of saree after two successive discounts

$$= \left(\frac{100 - 20}{100} \right) \times \left(\frac{100 - 12}{100} \right) x$$

$$= \frac{80 \times 88}{100 \times 100} x$$

According to question,

$$\frac{80 \times 88}{10000} x = 792$$

$$\Rightarrow x = \frac{792 \times 10000}{80 \times 88} = 1125$$

\therefore Market price of saree = ₹1125

60. Option (3) is correct.

Let radius of cylinder = r units

and height of cylinder = h units

\therefore Increase in curved surface area = 20% and height decreased by 4%

$$\Rightarrow \frac{100 + 20}{100} \times 2\pi rh = 2\pi r' \times \left[\frac{100 - 4}{100} \right] h$$

$$\Rightarrow \frac{120}{100} r = \frac{96}{100} r'$$

$$\Rightarrow r' = \frac{5}{4} r = \frac{125}{100} r$$

\Rightarrow Increase in radius is 25%

\therefore Change in volume

$$= \frac{\pi \left(\frac{5}{4} r \right)^2 \times \frac{24}{25} h - \pi r^2 h}{\pi r^2 h} \times 100$$

$$= \left(\frac{25}{16} \times \frac{24}{25} - 1 \right) \times 100$$

$$= \frac{8}{16} \times 100\% = 50\%$$

61. Option (3) is correct.

Clearly expenditure is more than the income in company A and C.

\therefore Profit is earned by only company B.

\therefore Profit percentage of company B

$$= \left[\frac{50 - 40}{40} \right] \times 100\% = 25\%$$

62. Option (3) is correct.

Prakash beats Ved by 280 m.

$$\therefore \text{Ratio of speed of Prakash and Ved}$$

$$= 1000 : 720 = 25 : 18$$

Ved beats Rahul by 100 m.

$$\therefore \text{Ratio of speeds of Prakash and Rahul}$$

$$= \frac{25 \times 10}{18 \times 9}$$

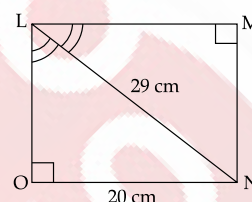
$$= \frac{1000}{648}$$

So, when Prakash travels 1000 m in same time Rahul travels only 648 m.

\therefore Prakash beats Rahul by = $(1000 - 648) = 352$ m.

63. Option (4) is correct.

As per the given information the figure will be:



Using Pythagoras theorem

In $\triangle OLN$ and $\triangle MLN$

$$\angle OLN = \angle MLN \text{ [Given]}$$

$$\angle LON = \angle LMN \text{ [Given]}$$

$$LN = LN \text{ (Common)}$$

$$\Rightarrow \triangle OLN \cong \triangle MLN$$

$$\therefore \text{Perimeter of } \triangle LMN = 20 + 21 + 29 = 70 \text{ cm.}$$

64. Option (3) is correct.

$$\therefore x^4 + \frac{1}{x^4} = 194$$

$$\Rightarrow \left(x^2 \right)^2 + \left(\frac{1}{x^2} \right)^2 + 2 \times x^2 \times \frac{1}{x^2} = 194 + 2 = 196 = 14^2$$

$$\Rightarrow \left(x^2 + \frac{1}{x^2} \right)^2 = 14^2$$

$$\Rightarrow x^2 + \frac{1}{x^2} = 14$$

$$\Rightarrow x^2 + \frac{1}{x^2} + 2 \times x \times \frac{1}{x} = 14 + 2 = 16 = 4^2$$

$$\Rightarrow x + \frac{1}{x} = 4$$

...(i)

$$\text{Now, } x^3 + \frac{1}{x^3} + x + \frac{1}{x}$$

$$= \left(x + \frac{1}{x} \right)^3 - 3 \left(x + \frac{1}{x} \right) + \left(x + \frac{1}{x} \right)$$

$$= 4^3 - 3 \times 4 + 4 = 64 - 8 = 56$$

65. Option (1) is correct.

Let cost price of watch = ₹ x

According to question

$$1600 - x = x - 1400$$

$$\begin{aligned}
 \Rightarrow 2x &= 3000 \\
 \Rightarrow x &= 1500 \\
 \therefore \text{Selling price to get 20\% profit} \\
 &= \frac{120}{100} \times 1500 \\
 &= ₹1800
 \end{aligned}$$

66. Option (3) is correct.

Let the principal = ₹P

$$\begin{aligned}
 \therefore \text{Simple interest} &= \frac{P \times R \times 2}{100} \\
 &\quad [R \rightarrow \text{rate of interest, } T = 2 \text{ years}] \\
 \Rightarrow \frac{50000}{2} &= PR \\
 \Rightarrow P &= \frac{25000}{R} \quad \dots(i)
 \end{aligned}$$

Difference between S.I. & C.I. for 2 years

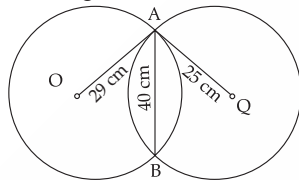
$$\begin{aligned}
 \text{C.I.} - \text{S.I.} &= P \left[\frac{R}{100} \right]^2 \\
 \Rightarrow 550 - 500 &= \frac{25000}{R} \times \frac{R^2}{10000} \\
 &\quad [\text{Using eqn (i)}]
 \end{aligned}$$

$$\begin{aligned}
 \Rightarrow \frac{50 \times 10}{25} &= R \\
 \Rightarrow R &= 20
 \end{aligned}$$

So rate of interest = 20%

67. Option (3) is correct.

As per the given, the figure will be:



$$\begin{aligned}
 OQ &= \sqrt{OA^2 - \left(\frac{AB}{2}\right)^2} + \sqrt{AQ^2 - \left(\frac{AB}{2}\right)^2} \\
 &= \sqrt{29^2 - 20^2} + \sqrt{25^2 - 20^2} \\
 &= 21 + 15 = 36 \text{ cm}
 \end{aligned}$$

68. Option (1) is correct.

Average runs scored in 42 innings = 30

\therefore Sum of runs in 42 innings = $30 \times 42 = 1260$

Also, Sum of runs in 40 innings excluding maximum (x) and minimum (y) scores

$$\begin{aligned}
 &= 28 \times 40 = 1120 \\
 \therefore x + y &= 1260 - 1120 = 140 \\
 \text{Also, } x - y &= 100 \\
 \Rightarrow x + y + x - y &= 140 + 100 \\
 \Rightarrow x &= 120
 \end{aligned}$$

\therefore Maximum score = 120

69. Option (1) is correct.

\therefore Number of food (units) = Number of Man \times Number of days

$$\Rightarrow 500 \times 25 = 625 \times \text{Number of days}$$

$$\Rightarrow \text{Number of days} = \frac{500 \times 25}{625} = 20$$

\therefore Food will last for 20 days if 125 more cadets will join.

70. Option (3) is correct.

\therefore Sum of angles of a triangle = 180°

$$\Rightarrow \angle A + \angle B + \angle C = 180^\circ$$

$$\Rightarrow 5x - 60^\circ + 2x + 40^\circ + 3x - 80^\circ = 180^\circ$$

$$\Rightarrow 10x = 280^\circ$$

$$\Rightarrow x = 28^\circ$$

$$\therefore \angle A = 5x - 60^\circ = 5 \times 28^\circ - 60^\circ = 80^\circ$$

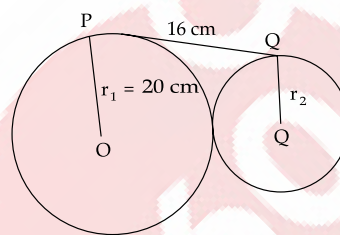
71. Option (4) is correct.

$$\therefore \sin \theta = \frac{13}{19}$$

$$\begin{aligned}
 \Rightarrow \cos \theta &= \sqrt{1 - \sin^2 \theta} = \sqrt{1 - \left(\frac{13}{19}\right)^2} \\
 &= \sqrt{1 - \frac{169}{361}} = \frac{8\sqrt{3}}{19}
 \end{aligned}$$

72. Option (1) is correct.

As per the given figure will be:



Length of common tangent = $2\sqrt{r_1 \times r_2}$

$$\Rightarrow 16 = 2\sqrt{20 \times r_2}$$

$$8 = \sqrt{20 \times r_2}$$

$$r_2 = \frac{64}{20} = 3.2$$

\therefore Radius of smaller circle = 3.2 cm

73. Option (1) is correct.

$$a + b + c = 5 \text{ and } a^2 + b^2 + c^2 = 15$$

$$\text{Now, } (a + b + c)^2 = 5^2$$

$$a^2 + b^2 + c^2 + 2(ab + bc + ca) = 25$$

$$15 + 2(ab + bc + ca) = 25$$

$$ab + bc + ca = 5$$

...(i)

$$\text{Now, } a^3 + b^3 + c^3 - 3abc - 27$$

$$= (a + b + c) (a^2 + b^2 + c^2 - ab - bc - ca) - 27$$

$$= 5 \times (15 - 5) - 27 = 50 - 27 = 23$$

74. Option (3) is correct.

Clearly, Hyderabad recorded the maximum temperature in May.

75. Option (3) is correct.

Given that $x^2 + y^2 = 427$ and $xy = 202$

$$\therefore x^2 + y^2 + 2xy = (x + y)^2$$

$$\begin{aligned}
 \Rightarrow x + y &= \sqrt{x^2 + y^2 + 2xy} \\
 &= \sqrt{427 + 2 \times 202} \\
 &= \sqrt{831}
 \end{aligned}$$

$$\text{Also, } x^2 + y^2 - 2xy = (x - y)^2$$

$$\Rightarrow x - y = \sqrt{x^2 + y^2 - 2xy}$$

$$= \sqrt{427 - 2 \times 202}$$

$$= \sqrt{23}$$

$$\therefore \frac{x + y}{x - y} = \frac{\sqrt{831}}{\sqrt{23}} = \frac{\sqrt{831}}{\sqrt{23}}$$

76. Option (2) is correct.

Meiosis is a type of cell division that leads to a reduction in the chromosome number, ultimately producing haploid cells. Therefore, it is often referred to as a "reduction division." This process predominantly occurs in the reproductive cells, namely, sperm in males and eggs in females.

On the other hand, mitosis is a form of cell division resulting in two daughter cells, each possessing the same number and types of chromosomes as the parent cell. This mechanism plays a vital role in the growth, repair, and maintenance of body tissues.

In meiosis, the chromosome number is halved, leading to genetic diversity in offspring, while mitosis maintains chromosome integrity and ensures the continuity of body functions.

77. Option (2) is correct.

Tharman Shanmugaratnam has recently been appointed as the President-elect of Singapore. He is an Indian-origin politician with a distinguished career in Singaporean politics and was a former member of Singapore's ruling party. His election victory saw him secure an impressive 70.4% of the votes in the country's presidential race.

78. Option (2) is correct.

Milam glacier, situated in the Kumaon Himalayas of Uttarakhand, serves as the origin of the Gori Ganga. This glacier contributes to the majestic flow of the Gori Ganga River as it traverses through the picturesque Milam Valley, ultimately merging with the Kali River.

79. Option (2) is correct.

Article 39A of the Indian Constitution addresses the principles of equal justice and free legal aid. This constitutional provision places a responsibility on the State to furnish free legal assistance, thereby guaranteeing access to justice for all citizens. Article 39A was introduced through the 42nd Constitutional Amendment Act.

In addition, Article 39 of the Indian Constitution emphasizes the State's policy direction to secure that both men and women enjoy an equal right to an adequate means of livelihood. This underscores the constitutional commitment to promoting economic equality and social justice in the country.

80. Option (2) is correct.

Festival	State
Durga Puja, Charak Puja, Saraswati Puja, Poila Boishak, Poush Sankranti	West Bengal
Pongal, Thiruvaiyaru Festival, Mahamaham, Natyanjali Dance Festival, Thaipusam, Karthigai Deepam, Chitri Rai Festival, and Jallikattu Bull Festival	Tamil Nadu
Sonepur Cattle festival, Sama Chakeva, Bihula, Madhushravani, Chhath Puja, Makar Sankranti	Bihar
Ratha Yatra, Chhau festival, Kalinga Mahotsav, Sitalsasthi Carnival, Konark Dance Festival, Gamha Purnima	Odisha

81. Option (2) is correct.

The Laser-Induced Breakdown Spectroscopy (LIBS), an instrument onboard the Pragyan rover of Chandrayaan-3, has successfully confirmed the presence of sulphur in the lunar South Pole region. Initial analyses have identified the existence of various elements on the lunar surface, including Aluminum (Al), Sulphur (S), Calcium (Ca), Iron (Fe), Chromium (Cr), and Titanium (Ti). Further measurements have revealed the presence of manganese (Mn), silicon (Si), and oxygen (O).

The LIBS instrument was developed at ISRO's Laboratory for Electro-Optics Systems (LEOS) in Bengaluru, and it played a crucial role in enabling scientists to detect sulphur at the lunar site. This discovery contributes to our growing understanding of the lunar composition and its geological history.

82. Option (1) is correct.

Article 16 of the Indian Constitution ensures equality of opportunity for all citizens regarding employment or appointment to any office under the State. It promotes a fair and non-discriminatory approach in matters of public employment.

Article 17 takes a strong stance against the practice of untouchability, explicitly making it an offense. This article seeks to eliminate the deep-rooted social evil of untouchability that has persisted in India's history.

Article 18 serves to abolish titles and honors, with exceptions for military and academic distinctions. Awards like Padma Shri, Padma Bhushan, Padma Vibhushan, Bharat Ratna, as well as military honors like Ashok Chakra and Param Vir Chakra, are not included in this prohibition.

Article 19 grants citizens the essential freedom of speech, allowing them to express their opinions without fear, whether through oral, written, electronic, broadcasting, or press mediums. This fundamental right is a cornerstone of democratic societies, promoting open discourse and the exchange of ideas.

83. Option (2) is correct.

Name	Organisation	Year
Rabindranath Tagore	Vishwa Bharti University	1921
Raja Ram Mohan Roy	Brahmo Sabha	1828
Keshub Chandra Sen	Bharatvarshiya Brahmo Samaj	1866
Devendra Nath Tagore	Brahmo religion	1848

84. Option (2) is correct.

Name	Founder
Jean-Baptiste Joseph Fourier	Representation of periodic wave as the sum of sine and cosine waves.
Louis de Broglie	De Broglie hypothesis, postulated wave nature of electrons
Joseph-Louis Lagrange	Number theory, celestial mechanics, calculus of variations, analytical mechanics
Ernest Walton	First disintegration of an atomic nucleus by artificially accelerated protons

85. Option (3) is correct.

Kepler's Third law of planetary motion states that 'the square of the orbital period (T) of a planet is directly proportional to the cube of the semi-major axis (a) of its elliptical orbit.' It is a

fundamental principle in understanding the motion of celestial bodies within our solar system. It is also known as the Law of Harmonies.

Hubble's law describes the relationship between the velocity of objects in the universe and their distance from an observer. It is also known as 'Hubble-Lemaître Law' and is named after American astronomer Edwin Hubble and Belgian astronomer Georges Lemaître, who both made significant contributions to understanding of the cosmos.

Bragg's law is the fundamental principle in the field of X-ray crystallography. It describes the relationship between the angles at which X-rays are scattered by a crystal lattice and the constructive interference of X-rays that results from their interaction with the crystal's atomic structure.

86. Option (3) is correct.

Mulayam Singh Yadav was posthumously honored with the Padma Vibhushan in 2023, recognized for his significant contributions in the category of Public Affairs. He was a prominent Indian politician renowned for his three terms as the Chief Minister of Uttar Pradesh and his role as the Union Defence Minister of India. Fondly referred to as 'Dhartiputra' and 'Netaji,' Mulayam Singh Yadav passed away in 2022 at the age of 82.

The Padma Vibhushan, India's second-highest civilian award, is bestowed upon individuals who have made noteworthy achievements in various fields such as art, social work, literature and education, public affairs, and more. It stands as a testament to their outstanding contributions to society and their respective domains.

87. Option (3) is correct.

Zaid crops are short-season summer crops cultivated between March and June, and they encompass a variety of produce such as watermelon, muskmelon, cucumber, vegetables, and fodder crops.

Kharif crops, on the other hand, thrive during the monsoon season, relying on ample rainfall for their growth. Some notable examples of Kharif crops include rice, millet, ragi, pulses, soybean, and groundnut. These crops are typically sown from June to September and are usually ready for harvest by October or November.

Rabi crops are winter crops sown at the onset of the winter season, usually around October or November. These crops are harvested during the spring season and include crops like wheat, barley, oats, gram, and mustard, among others.

In South Asia, three main varieties of rice are cultivated: Aman, aus, and boro, each adapted to specific environmental conditions and planting seasons.

88. Option (3) is correct.

Bhimsen Joshi was a famous Indian singer known for his Hindustani classical music. He sang in a style called "khayal" and also sang devotional songs. He was part of a musical tradition called the Kirana gharana and is remembered for his great contributions to music. He passed away at the age of 88, but his music still lives on.

Begum Akhtar, a well-known figure, was not only an Indian actress but also a fantastic singer, often called the "Queen of Ghazals." She sang in different styles of Hindustani classical music, including Dadra and thumri. She received important awards like the Sangeet Natak Akademi Award and the Padma Shri. Even after her passing, she was honored with the Padma Bhushan.

Chitra Singh, a talented Indian singer known for ghazals, was not only an artist but also the wife of the famous ghazal singer Jagjit Singh. Jagjit Singh was a pioneer in popularizing ghazals in Indian classical music. He received the Padma

Bhushan in 2003, and in 2014, the government released two postage stamps in his honor to celebrate his significant impact on music.

89. Option (2) is correct.

Luna-25 marked Russia's initial endeavor to land a spacecraft on the Moon in the modern era. Unfortunately, this mission ended in failure when the spacecraft crashed onto the lunar surface. The primary objective was to achieve the historic feat of landing on the Moon's south pole. However, technical issues arose during its approach to the lunar surface, leading to the mission's unsuccessful conclusion. It's noteworthy that India's space agency, ISRO, had previously achieved a soft landing on the Moon's south pole, making India the first country to accomplish this remarkable feat.

90. Option (4) is correct.

The Muslim League was established in 1906 in Dhaka, Bangladesh, with the primary aim of representing the interests of Muslims in British India before it was partitioned. Prominent figures such as Khwaja Salimullah, Vikar-ul-Mulk, Syed Amir Ali, Syed Nabiullah, Khan Bahadur Ghulam, and Mustafa Chowdhury were among its founders. Aga Khan III served as the inaugural president of the league. Notably, the Muslim League was the first political party in India dedicated to advocating for the civil rights of Muslims. It played a pivotal role in shaping the idea of a separate Muslim-majority state, eventually leading to the creation of Pakistan. The league's green flag featuring a white star and crescent went on to become an enduring symbol of Muslim political identity in both British India and later in Pakistan.

91. Option (2) is correct.

India had the honor of hosting the G-20 summit in 2023, which took place at the Bharat Mandapam International Exhibition-Convention Centre (IECC) in Pragati Maidan, New Delhi, from September 9th to 10th, 2023. The summit revolved around the theme of 'Vasudhaiva Kutumbakam,' a Sanskrit phrase that translates to 'One Earth, One Family, One Future.' Notably, the G20 New Delhi Summit was presided over by India's Prime Minister, Narendra Modi, who served as the chairperson of the event.

92. Option (4) is correct.

The income method is one of the approaches used to estimate a nation's total income, often referred to as the National Income. This method involves assessing the income generated from the fundamental factors of production, including land, capital, labor, and organization. It encompasses various forms of income, such as wages, rental income from buildings and land, interest earned on capital, and business profits, among others, over the course of an accounting year. Essentially, the income method calculates a country's Gross Domestic Product (GDP) by summing up all the earnings accrued by individuals and businesses operating within the country during the specified period. This approach offers a comprehensive view of a nation's economic performance and contributes to its economic analysis and policymaking.

93. Option (4) is correct.

Tushar Deshpande made history by becoming the first 'Impact Player' in the Indian Premier League's (IPL) history. He stepped in as a replacement for Ambati Rayudu in the Chennai Super Kings' lineup during the IPL 2023 opener against the Gujarat Titans at the Narendra Modi Stadium in Ahmedabad, Gujarat. The 'Impact Player' rule is an innovative addition that permits teams to substitute a player into the playing XI at any juncture during the match. This substitute player has the freedom to bat, bowl, and participate in fielding activities, with the exception of captaining the team. This rule adds an

intriguing dynamic to IPL matches, allowing teams to adapt strategically during the game.

94. Option (3) is correct.

The 2026 Winter Olympics are set to be hosted by Milan and Cortina d'Ampezzo, Italy. Officially known as the XXV Olympic Winter Games or Milano-Cortina 2026, this exciting event is scheduled to take place from February 6 to February 22, 2026. The motto for these games is "Dreaming together." This will mark the fourth occasion that Italy has hosted the Olympics, with the previous three being the 1956 Winter Olympics in Cortina d'Ampezzo, the 1960 Summer Olympics in Rome, and the 2006 Winter Olympics in Turin.

Additionally, it's worth noting that the 2024 Summer Olympics will be held in Paris, France, and the 2028 Summer Olympics are scheduled for Los Angeles, California, in the United States.

95. Option (1) is correct.

Fiscal policy means how the government uses money and taxes to help the country's economy. It has three main parts: the money the government gets, the money it spends, and the money it owes. The Ministry of Finance decides on fiscal policy, and it's really important for keeping prices steady, creating jobs, and making the economy grow. Fiscal policy uses different tools like taxes, budgets, spending money on things, managing the money the government owes, and investing in public projects. Taxes are a big part of how a country gets money, and that money can be used for making the country better.

On the other hand, monetary policy is about how the Reserve Bank of India controls the amount of money in the economy. It uses things like the Repo rate, Reverse Repo Rate, Open Market Operations (OMO), Cash Reserve Ratio (CRR), Statutory Liquidity Ratio (SLR), and Bank rate to do this. These tools help the central bank manage the financial system and influence how the economy works.

96. Option (4) is correct.

Gugga is a religious dance exclusively performed by men in Haryana. It is part of a procession held in memory of Saint Gugga.

Khoria, on the other hand, is an Indian folk dance performed by women in the central regions of Haryana. It serves as an alternative to the 'Jhumar' dance and is known for its high speed. Khoria is typically reserved for auspicious occasions like weddings and special functions.

Moving to Punjab, we find the Gidda, another Indian folk dance, but this one is performed by women. Gidda involves rhythmic clapping and singing traditional folk songs while dancing.

Lastly, Ghoomar is a traditional folk dance originating from Rajasthan. Veiled women wearing ghaghara (traditional Rajasthani attire) perform this graceful dance, making it a significant cultural expression of the region.

97. Option (4) is correct.

Economic activity encompasses any human endeavor conducted in exchange for money or value. These activities can be categorized into the following subheads:

- I. Consumption involves individuals and households utilizing goods and services to meet their needs and desires.
- II. Production entails the creation of goods and services through the utilization of various resources like labor, capital, and raw materials. It encompasses the conversion of inputs into finished products or services that hold value for consumers.
- III. Distribution refers to the allocation and transportation of goods and services from producers to consumers or end-users.

These categories help us understand the various facets of economic engagement in society.

98. Option (1) is correct.

A country's economic wealth is not solely reliant on the possession of resources. While having natural resources can enable a country to capitalize on them through prudent utilization, this principle does not universally apply in all cases.

99. Option (3) is correct.

The Gahadavalas dynasty reigned over Kannauj, Uttar Pradesh, during the 11th and 12th centuries, with their capital situated in Varanasi. This illustrious dynasty was established by Govindachandra and left an indelible mark on art, literature, and culture during their rule. The pinnacle of these cultural achievements occurred under the reign of King Jaichand (Jayachandra).

100. Option (1) is correct.

In the previous industrial licensing system, large industrial corporations would obtain licenses to maintain a monopoly in their respective sectors, effectively limiting competition. However, this system was abolished with the introduction of the Liberalisation, Privatisation, and Globalisation (LPG) policy in 1991. The LPG policy marked the end of the era known as the "license raj," where bureaucratic red tape and regulations controlled industrial activities. This policy shift also facilitated increased foreign investments in India, promoting economic liberalization and globalization.

